1. A customer profiling apparatus for conducting customer behavior pattern analysis, comprising:

processing circuitry operative to process customer records;

a data warehouse coupled with the processing circuitry and configured to store the processed customer records;

a profiling engine communicating with the data warehouse and operative to build and update customer behavior profiles by mining the customer records that flow into the data warehouse; and

at least one computer program, performed by the profiling engine, and operative to define behavior profiles as data cubes and derive similarity measures on patterns extracted from the behavior profiles.

2. The apparatus of claim 1 wherein the profiling engine is an OnLine Analytical Processing (OLAP) based scalable and flexible profiling engine.

3. The apparatus of claim 1 wherein the profiling engine comprises a commercial data warehouse server and a multi-dimensional OLAP server.

4. The apparatus of claim 1 wherein the profiling engine implements multi-level, multi-dimensional pattern analysis and comparison.

5. The apparatus of claim 1 wherein the behavior profiles are defined at least in part by probability distributions.

6. The apparatus of claim 1 wherein similarity measures are defined and computed on the patterns extracted from the behavior profiles.

7. The apparatus of claim 1 wherein the computer program is further operative to compare the data cubes with similarity measures identifying fraud so as to extract fraud detection from the behavior profiles.

8.   The apparatus of claim 1 wherein the customer records comprise customer communication call records, and the behavior profiles are derived from telephone call data.

9.   The apparatus of claim 8 wherein the behavior profiles are analyzed to detect caller fraud.

10.   The apparatus of claim 1 wherein the customer records comprise customer call records, the profiling engine builds and updates customer calling behavior profiles by mining the customer call records, and the computer program derives similarity measures on patterns extracted from the call behavior profiles.

11.   A profiling apparatus, comprising:
a data warehouse for storing customer records;
a profiling engine communicating with the data warehouse and operative to generate customer behavior profiles from the customer records within the data warehouse; and
a computer application program implemented on the profiling engine and operative to represent behavior profiles as patterns and derive similarity measures of the patterns usable to profile customer behavior.

12.   The apparatus of claim 11 wherein the profiling engine is configured to define customer behavior profiles using probability distributions, and to compute the customer behavior profiles using OLAP operations on multi-dimensional and multi-level data cubes.

13.   The apparatus of claim 12 wherein one multi-level data cube comprises a profile cube.

14.   The apparatus of claim 13 wherein another multi-level data cube comprises a profile-snapshot cube.

1   15.   The apparatus of claim 14 wherein yet another data cube

2   comprises an updated profile cube formed by merging together the profile cube and

3   the profile-snapshot cube.

1   16.   The apparatus of claim 15 wherein the updated profile cube is

2   stored within a profile table of the data warehouse such that subsequent customer

3   profiling utilizes customer records from the data warehouse comprising the updated

4   profile cube.

1   17.   A method for comparing customer behavior patterns, comprising:

2   providing call data in the form of call data records to a data warehouse;

3   loading the call data records into an OLAP server;

4   generating a profile-snapshot cube accommodating multiple customers;

5   in combination with generating the profile-snapshot cube, generating a

6   profile cube for the same set of customers from the data warehouse;

7   updating the profile cube by merging the profile cube with the profile-

8   snapshot cube; and

9   storing the updated profile cube in the data warehouse.

1   18.   The method of claim 17 wherein the data warehouse comprises

2   profile tables configured to store the profile cube.

1   19.   The method of claim 17 wherein the updated profile cube is

2   subdivided into a plurality of individual calling pattern cubes, each representative of

3   individual customers.

1   20.   The method of claim 19 further comprising the step of performing

2   at least one of reporting, analyzing, and visualizing of one of the calling pattern cubes

3   for an individual customer.